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SAMSUNG ELECTRONICS

Approval

TO : Dell / Quanta

DATE : June. 20, 2011

SAMSUNG TFT-LCD

MODEL NO. : LTN140AT20-D

NOTE : Extension code [-D]
→ LTN140AT20-D
- Surface type [**Glare**]

The information described in this SPEC is preliminary and can be changed without prior notice.

APPROVED BY :

PREPARED BY : **Application Engineering Group**

Samsung Electronics Co., Ltd.

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CONTENTS

Revision History ---------- (3)

General Description ---------- (4)

1. Absolute Maximum Ratings ---------- (5)
   1.1 Absolute Ratings of environment
   1.2 Electrical Absolute Ratings

2. Optical Characteristics ---------- (7)

3. Electrical Characteristics ---------- (10)
   3.1 TFT LCD Module
   3.2 LED Driver

4. Block Diagram ---------- (13)
   4.1 TFT LCD Module
   4.2 LED connection and placement

5. Input Terminal Pin Assignment ---------- (14)
   5.1 Input Signal & Power
   5.2 LVDS Interface
   5.3 Timing Diagrams of LVDS For Transmitting
   5.4 Input Signals, Basic Display Colors and Gray Scale of Each Color.
   5.5 Pixel format

6. Interface Timing ---------- (19)
   6.1 Timing Parameters
   6.2 Timing Diagrams of interface Signal
   6.3 Power ON/OFF Sequence

7. Outline Dimension ---------- (22)

8. Packing ---------- (23)

9. Markings & Others ---------- (24)

10. General Precautions ---------- (26)

11. EDID ---------- (28)

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REVISION HISTORY

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Date	Rev. No.	Page	Summary
Feb. 21, 2011	P00	All	The preliminary specification was issued first.
Jun. 4, 2011	A00	-	The approval specification of LTN140AT20-D model was issued first.

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GENERAL DESCRIPTION

DESCRIPTION

LTN140AT20-D is a color active matrix TFT (Thin Film Transistor) liquid crystal display (LCD) that uses amorphous silicon TFT as a switching devices. This model is composed of a TFT LCD panel, a driver circuit and a backlight unit. The resolution of a 14.0" contains 1,366 x 768 pixels and can display up to 262,144 colors. 6 O'clock direction is the Optimum viewing angle.

FEATURES

- High contrast ratio, high aperture structure
- 1366 x 768 pixels resolution
- Low power consumption
- Fast response time
- LED BLU structure
- DE (Data enable) only mode.
- 3.3V LVDS Interface
- On board EEDID chip
- RoHS compliance
- Halogen free product
- As free compliance
- APS function

APPLICATIONS

- Notebook PC
- If the usage of this product is not for PC application, but for others, please contact SEC.

GENERAL INFORMATION

Item	Specification	Unit	Note
Display area	309.399(H) x 173.952(V) (14.0” diagonal)	mm	
Driver element	a-Si TFT active matrix		
Display colors	262,144		
Number of pixel	1366 x RGB(3) x 768	pixel	16 : 9
Pixel arrangement	RGB vertical stripe		
Pixel pitch	0.2265(H) x 0.2265(V) (TYP.)	mm	
Display Mode	Normally white		
Surface treatment	Haze 0%, Hardness 3H		Glare

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Mechanical Information

Item		Min.	Typ.	Max.	Unit	Note
Module size	Horizontal (H)	319.9	320.4	320.9	mm	
	Vertical (V)	193.2	193.5	193.8	mm	w/o PCB and bracket
		204.6	205.1	205.6	mm	w/ PCB and bracket
	Depth (D)	-	-	3.6	mm	(1)
Weight		-	-	320	g	

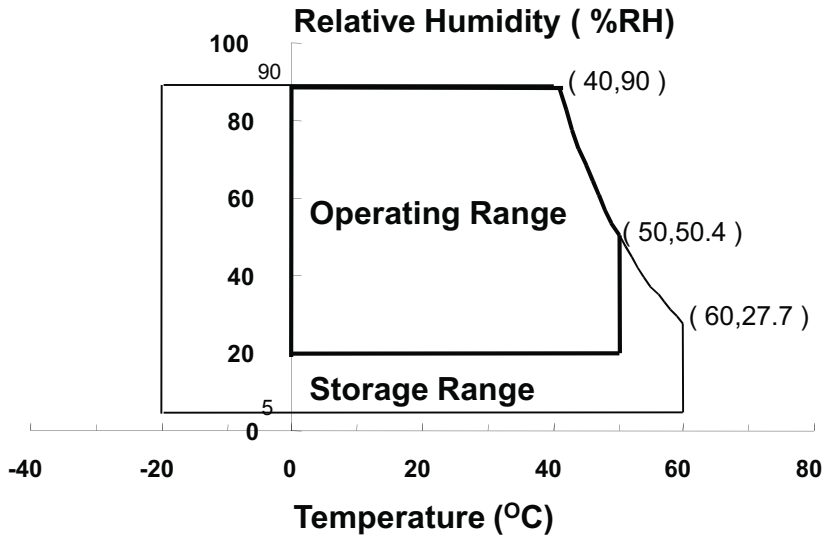
Note (1) Measurement condition of outline dimension
. Equipment : Vernier Calipers
. Push Force : 500g ·f (minimum)

1. ABSOLUTE MAXIMUM RATINGS

1.1 ENVIRONMENTAL ABSOLUTE RATINGS

Item	Symbol	Min.	Max.	Unit	Note
Storage temperate	TSTG	-20	60	°C	(1)
Operating temperate (Temperature of glass surface)	TOPR	0	50	°C	(1)
Shock (non-operating)	Snop	-	240	G	(2),(4)
Vibration (non-operating)	Vnop	-	2.41	G	(3),(4)

Note (1) Temperature and relative humidity range are shown in the figure below.
95 % RH Max. (40 °C ≥ Ta)
Maximum wet - bulb temperature at 39 °C or less. (Ta > 40 °C) No condensation



(2) 2ms, half sine wave, one time for ±X, ±Y, ± Z.
(3) 5 - 500 Hz, random vibration, 30min for X, Y, Z.
(4) At testing Vibration and Shock, the fixture in holding the Module to be tested have to be hard and rigid enough so that the Module would not be twisted or bent by the fixture.

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1.2 ELECTRICAL ABSOLUTE RATINGS

(1) TFT LCD MODULE

V_{DD} =3.3V, V_{SS} = GND = 0V

Item	Symbol	Min.	Max.	Unit	Note
Power Supply Voltage	V_{DD}	V_{DD} - 0.3	V_{DD} + 0.3	V	(1)
Logic Input Voltage	V_{IN}	V_{DD} - 0.3	V_{DD} + 0.3	V	(1)

Note (1) Within Ta (25 ± 2 °C)

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2. OPTICAL CHARACTERISTICS

The following items are measured under stable conditions. The optical characteristics should be measured in a dark room or equivalent state with the methods shown in Note (5). Measuring equipment : TOPCON SR-3

* Ta = 25 ± 2 °C, V_{DD}=3.3V, fv= 60Hz, f_{DCLK} = 69.3MHz, I_L = 23 mA

Item		Symbol	Condition	Min.	Typ.	Max	Unit	Note
Contrast Ratio (5 Points)		CR	Normal Viewing Angle $\phi = 0$ $\theta = 0$	500	600	-	-	(1), (2), (5)
Response Time at Ta (Rising + Falling)		T_{RT}		-	16	25	msec	(1), (3)
Average Luminance of White (5 Points)		$Y_{L,AVE}$		170	200	-	cd/m^2	(1), (4)
Color Chromaticity (CIE)	Red	R_X		Typ -0.03	0.577	Typ +0.03	-	(1), (5) PR-650
		R_Y			0.352			
	Green	G_X			0.345			
		G_Y			0.565			
	Blue	B_X			0.165			
		B_Y			0.118			
	White	W_X			0.313			
		W_Y			0.329			
Viewing Angle	Hor.	θ_L	CR ≥ 10	40	-	-	Degrees	(1), (5) SR-3
		θ_R		40	-	-		
	Ver.	ϕ_H		15	-	-		
		ϕ_L		30	-	-		
Color Gamut		CG		-	45	-	%	
13 Points White Variation		δ_L		-	-	1.6	-	(6)

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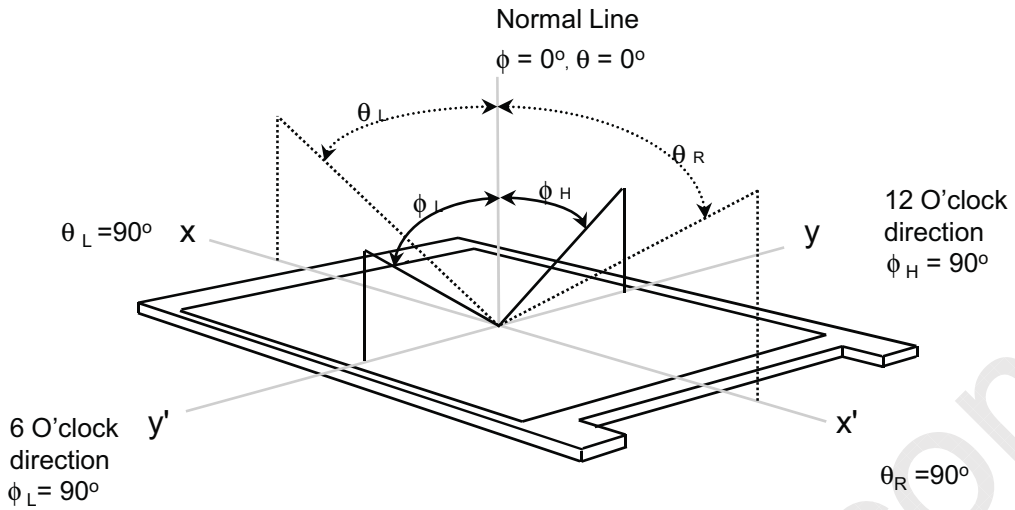
Note 1) Definition of Viewing Angle : Viewing angle range(10 ≤ C/R)

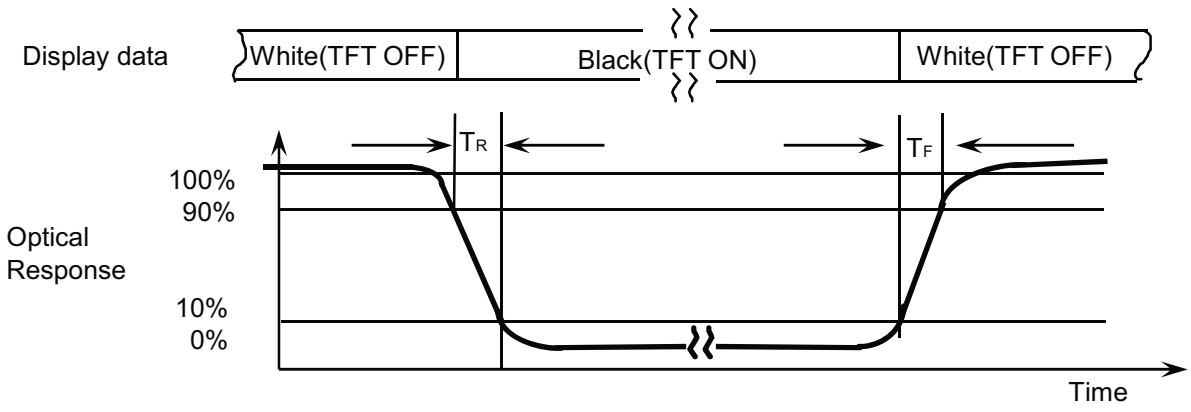


Note 2) Definition of Contrast Ratio (CR) : Ratio of gray max (Gmax) ,gray min (Gmin) at 5 points(4, 5, 7, 9, 10)

$$CR = \frac{CR(4) + CR(5) + CR(7) + CR(9) + CR(10)}{5}$$

Points : ⑬ , ㊲ , ㊺ , ㊼ , ㊼ at the figure of Note (6).

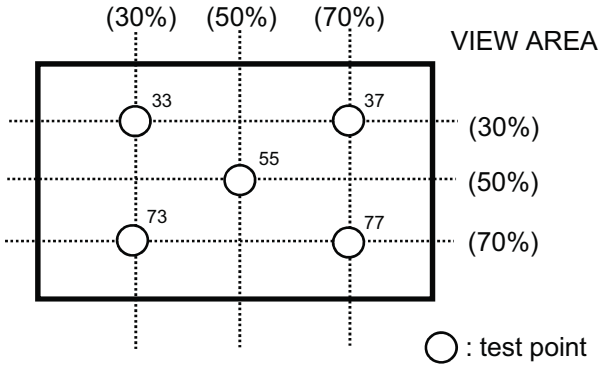
Note 3) Definition of Response time :



Note 4) Definition of Average Luminance of White : measure the luminance of white at 5 points.

Average Luminance of White ($Y_{L,AVE}$)

$$Y_{L,AVE} = \frac{Y_{L4} + Y_{L5} + Y_{L7} + Y_{L9} + Y_{L10}}{5}$$



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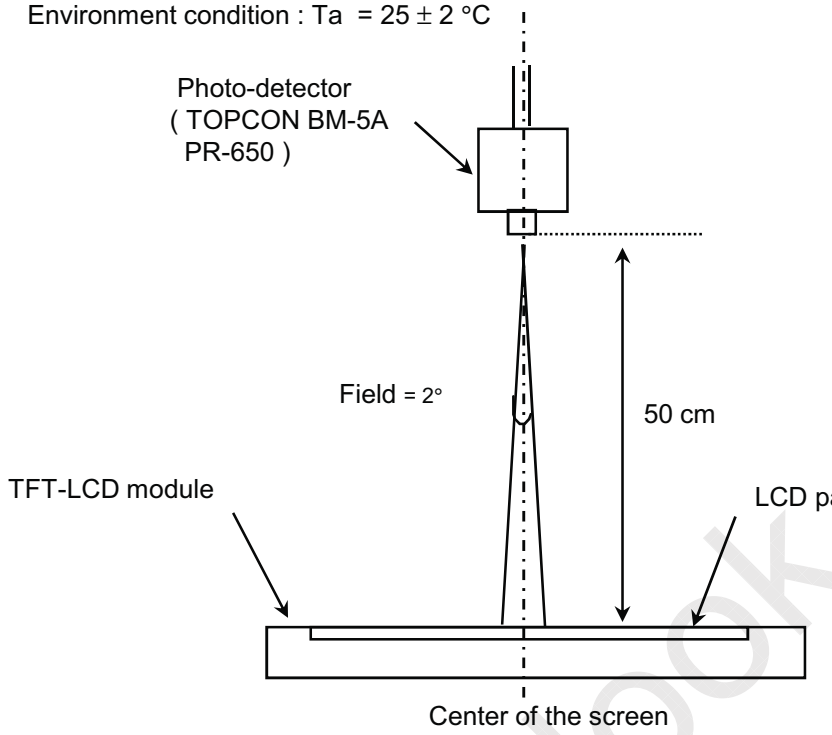
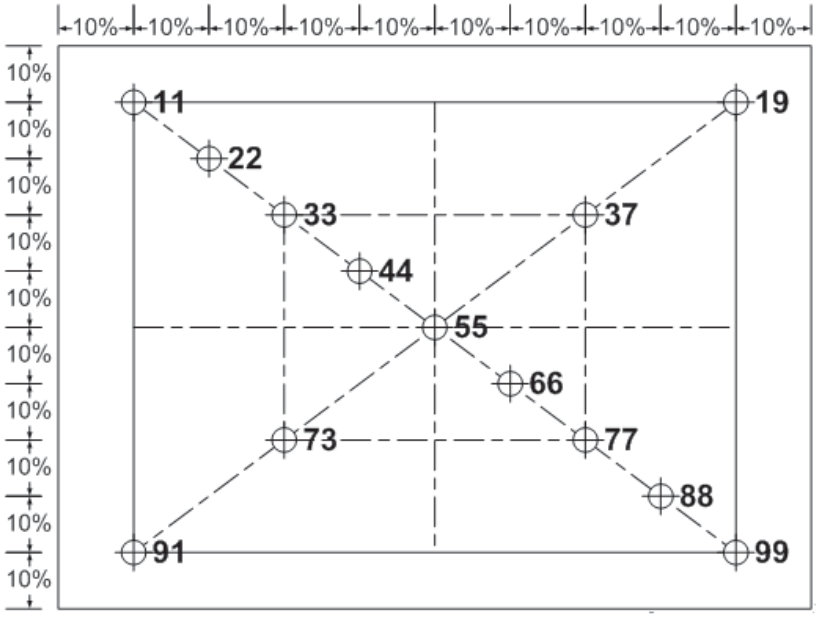
Note 5) After stabilizing and leaving the panel alone at a given temperature for 30 min , the measurement should be executed. Measurement should be executed in a stable, windless,and dark room.
30 min after lighting the backlight. This should be measured in the center of screen.
Environment condition : Ta = 25 ± 2 °C



[Optical characteristics measurement setup]

Note 6) Definition of 13 points white variation (δ_L), CR variation(C_{VER}) [① ~ ⑬]

$$\delta_L = \frac{\text{Maximum luminance of 13 points}}{\text{Minimum luminance of 13 points}}$$



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3. ELECTRICAL CHARACTERISTICS

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3.1 TFT LCD MODULE

Ta= 25 ± 2°C

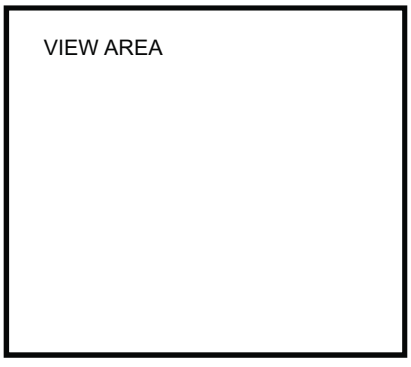
Item		Symbol	Min.	Typ.	Max.	Unit	Note
Voltage of Power Supply		V_{DD}	3.0	3.3	3.6	V	
Differential Input Voltage for LVDS Receiver Threshold	High	V_{IH}	-	-	+100	mV	
	Low	V_{IL}	-100	-	-	mV	
Vsync Frequency		fv	-	60	-	Hz	
Hsync Frequency		fh	-	87.7	-	KHz	fv*(1462)
Main Frequency		f_{DCLK}	-	69.3	-	MHz	fh*(790)
Rush Current		I_{RUSH}	-	-	1.5	A	(4)
Current of Power Supply	White	I_{DD}	-	210	-	mA	(2),(3)*a
	Mosaic		-	-	240	mA	(2),(3)*b

Note (1) Display data pins and timing signal pins should be connected.(GND = 0V)

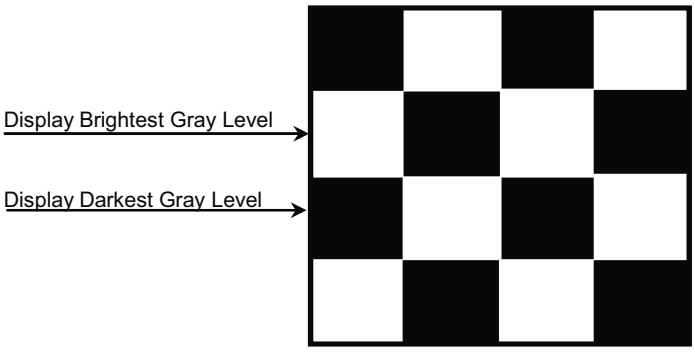
(2) f_V = 60Hz, f_{DCLK} = 69.3MHZ, V_{DD} = 3.3V , DC Current.

(3) Power dissipation pattern

*a) White Pattern



*b) Mosaic Pattern



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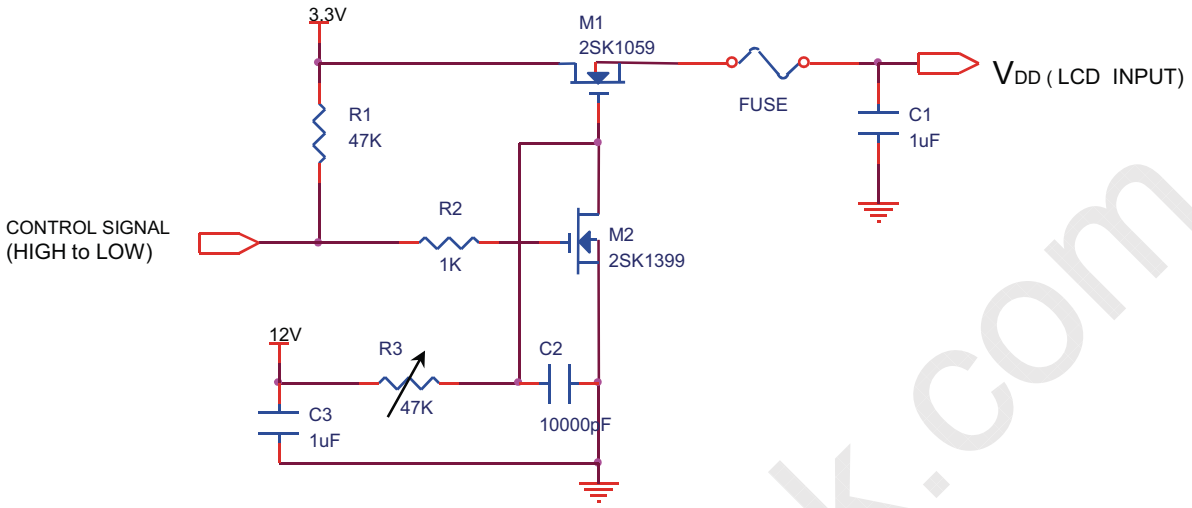
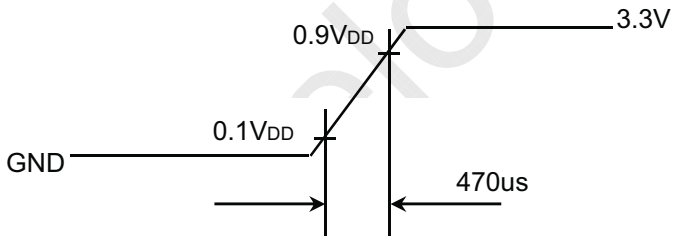
4) Rush current measurement condition



VDD rising time is 470us



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3.2 BACK-LIGHT UNIT

Ta= 25 ± 2 °C

Item	Symbol	Min.	Typ.	Max.	Unit	Note
LED Forward Current	IF	-	23	-	mA	
LED Forward Voltage	VF	-	3.2	-	V	
LED Array Voltage	VP	-	32	-	V	VF X 10LEDs
Power Consumption	P	-	-	3.2	W	IF X VF X 30LEDs
Operating Life Time	Hr	15,000	-	-	Hour	(1)

Note (1) Life time (Hr) of LEDs can be defined as the time in which it continues to operate under the condition Ta= 25 ± 2 °C and IF = 23mA until one of the following event occurs.
When the brightness becomes 50% or lower than the original.

3.3 LED Driver

- LED Driver Manufacturer : Richtek

Ta= 25 ± 2 °C

Item	Symbol	Min.	Typ.	Max.	Unit	Note
Input Voltage	V_{in}	7.5	12	21	V	
PWM duty ratio	D	10	-	100	%	
External PWM Dimming Control Frequency (BLIM)	F_{BLIM}	0.2	-	1	kHz	BLIM=PWM 0V~3.3V

Note - Test Equipment : Fluke 45

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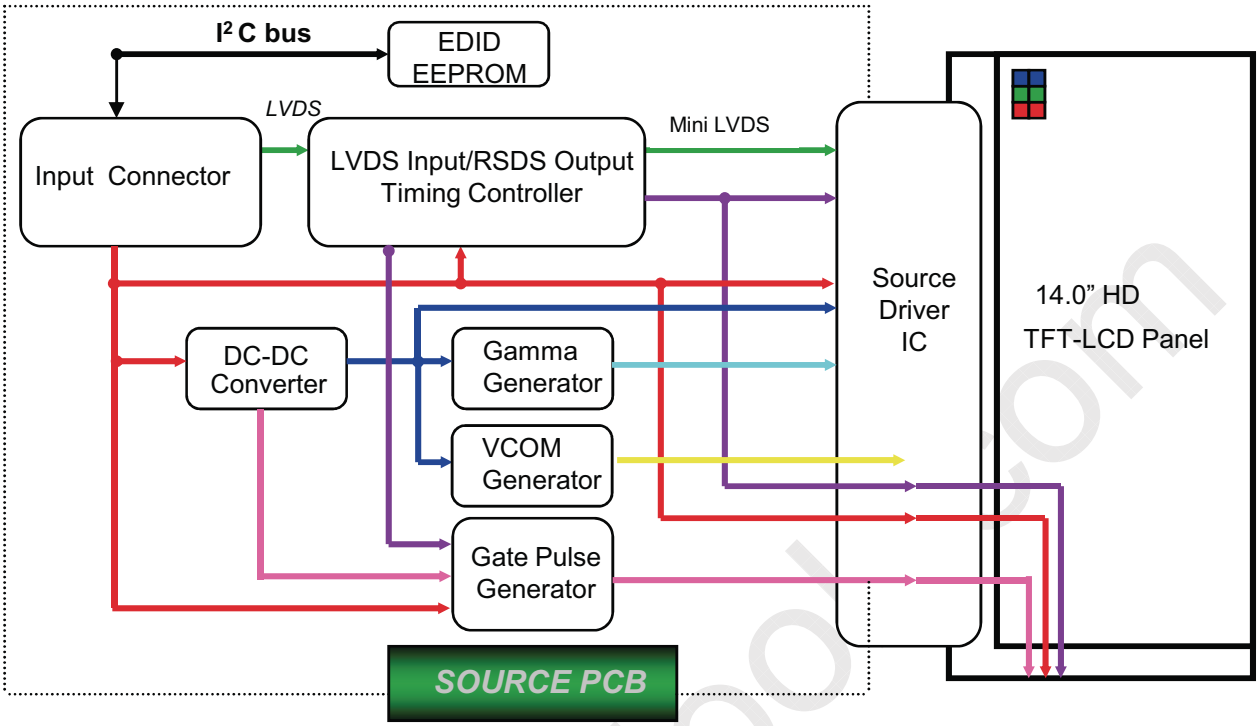
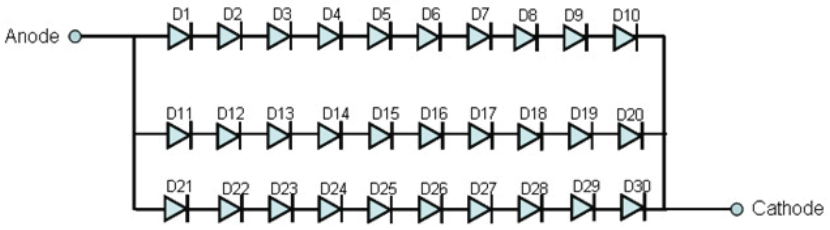
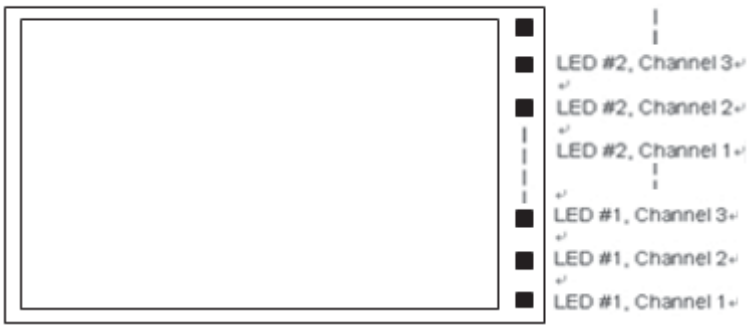
4. BLOCK DIAGRAM

4.1 TFT LCD Module



4.2 LED connection and placement





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5. INPUT TERMINAL PIN ASSIGNMENT

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5.1. Input Signal & Power (LVDS, Connector : I-PEX 20455-040E or equivalent)

Pin	Symbol	Function
1	NC	No connection
2~3	VDD	Power Supply, 3.3V (typical)
4	V EEDID	DDC 3.3V power
5	TEST	Panel Self Test
6	SCL	DDC clock
7	SDA	DDC data
8	RIN0-	- LVDS differential data input (R0-R5, G0)
9	RIN0+	+ LVDS differential data input (R0-R5, G0)
10	GND	Ground
11	RIN1-	- LVDS differential data input (G1-G5, B0-B1)
12	RIN1+	+ LVDS differential data input (G1-G5, B0-B1)
13	GND	Ground
14	RIN2-	- LVDS differential data input (B2-B5,HS,VS, DE)
15	RIN2+	+ LVDS differential data input (B2-B5,HS,VS, DE)
16	GND	Ground
17	CLK-	- LVDS differential clock input
18	CLK+	+ LVDS differential clock input
19	GND	Ground
20 ~ 21	NC	No connection
22	GND	Ground
23 ~ 24	NC	No connection
25	GND	Ground
26 ~ 27	NC	No connection
28	GND	Ground
29 ~ 30	NC	No connection
31 ~ 33	VLED_GND	LED Ground
34	NC	No connection
35	PWM	System PWM Signal Input (+3.3V Swing)
36	LED_EN	LED enable pin (+3.3V input)
37	DBC_EN	DBC enable from +2.5V to +3.3V; DBC disable to Grounding
38~40	VLED_VBL	LED Power Supply 7.5V-21V

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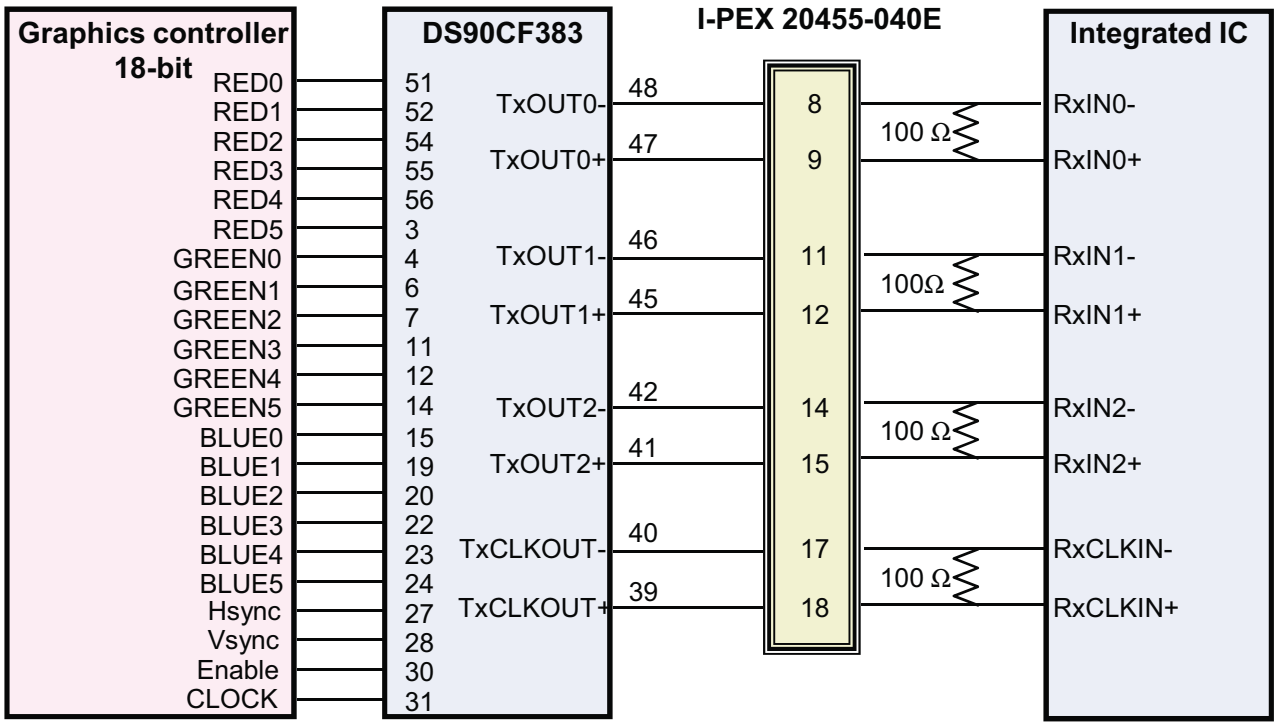
5.2 LVDS Interface

Pin No.	Name	RGB Signal	Pin No.	Name	RGB Signal
51	TxIN0	R0	14	TxIN14	G5
52	TxIN1	R1	15	TxIN15	B0
54	TxIN2	R2	19	TxIN18	B1
55	TxIN3	R3	20	TxIN19	B2
56	TxIN4	R4	22	TxIN20	B3
3	TxIN6	R5	23	TxIN21	B4
4	TxIN7	G0	24	TxIN22	B5
6	TxIN8	G1	27	TxIN24	Hsync
7	TxIN9	G2	28	TxIN25	Vsync
11	TxIN12	G3	30	TxIN26	DE
12	TxIN13	G4	31	TxCLKIN	Clock

LVDS INTERFACE



Note : The LCD Module uses a 100ohm resistor between positive and negative lines of each receiver input.

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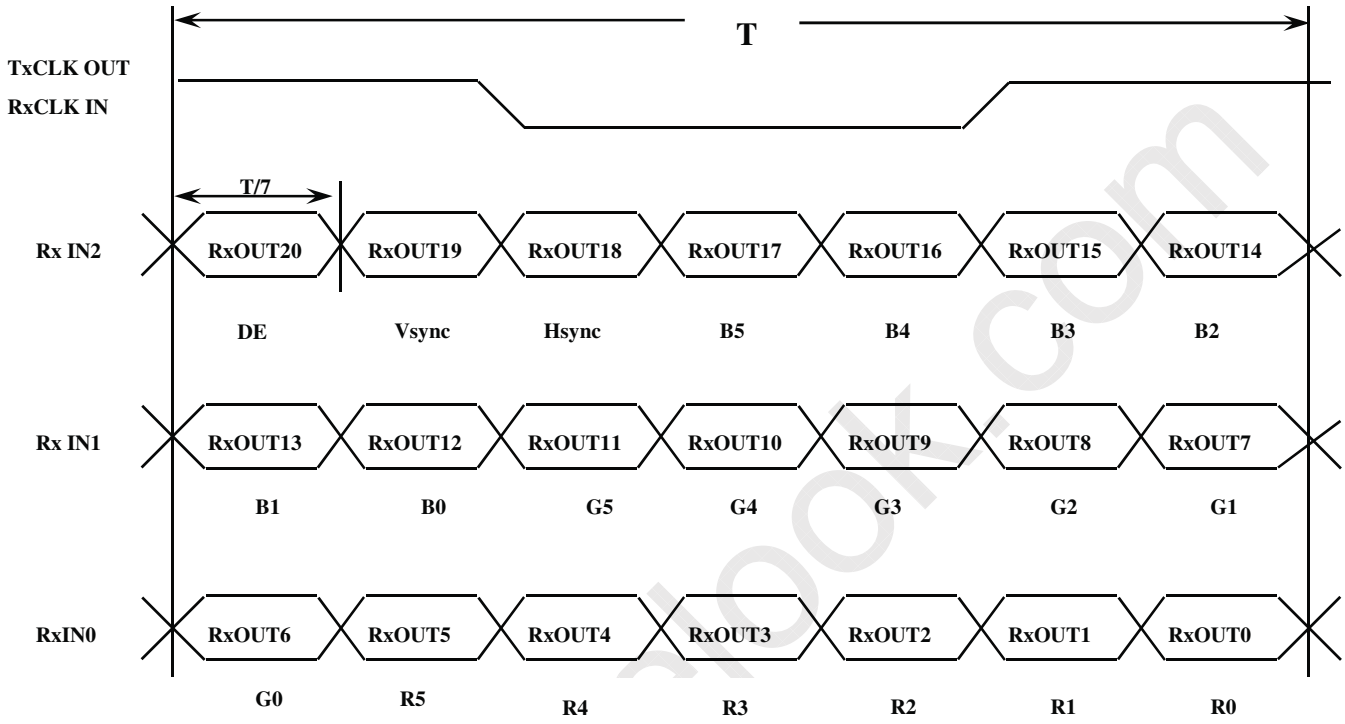
5.3 Timing Diagrams of LVDS For Transmission

LVDS Receiver : Integrated T-CON



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5.5 Input Signals, Basic Display Colors and Gray Scale of Each Color

Color	Display	Data Signal																		Gray Scale Level
		Red						Green						Blue						
		R0	R1	R2	R3	R4	R5	G0	G1	G2	G3	G4	G5	B0	B1	B2	B3	45	B5	
Basic Colors	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	-
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	-
	Cyan	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	-
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	-
	Magenta	1	1	1	1	1	1	0	0	0	0	0	0	1	1	1	1	1	1	-
	Yellow	1	1	1	1	1	1	1	1	1	1	1	1	0	0	0	0	0	0	-
	White	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	-
Gray Scale Of Red	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R0
	Dark	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R1
	↑	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	R2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	R3~R60
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	↓	1	0	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	R61
	Light	0	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	R62
	Red	1	1	1	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	R63
Gray Scale Of Green	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	G0
	Dark	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	G1
	↑	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	G2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	G3~G60
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	↓	0	0	0	0	0	0	1	0	1	1	1	1	0	0	0	0	0	0	G61
	Light	0	0	0	0	0	0	0	1	1	1	1	1	0	0	0	0	0	0	G62
	Green	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	0	0	0	G63
Gray Scale Of Blue	Black	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	B0
	Dark	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	B1
	↑	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	B2
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	B3~B60
	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	:	
	↓	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	1	1	1	B61
	Light	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	B62
	Blue	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	B63

Note 1) Definition of gray :
Rn: Red gray, Gn: Green gray, Bn: Blue gray (n=gray level)
Note 2)Input signal: 0 =Low level voltage, 1=High level voltage

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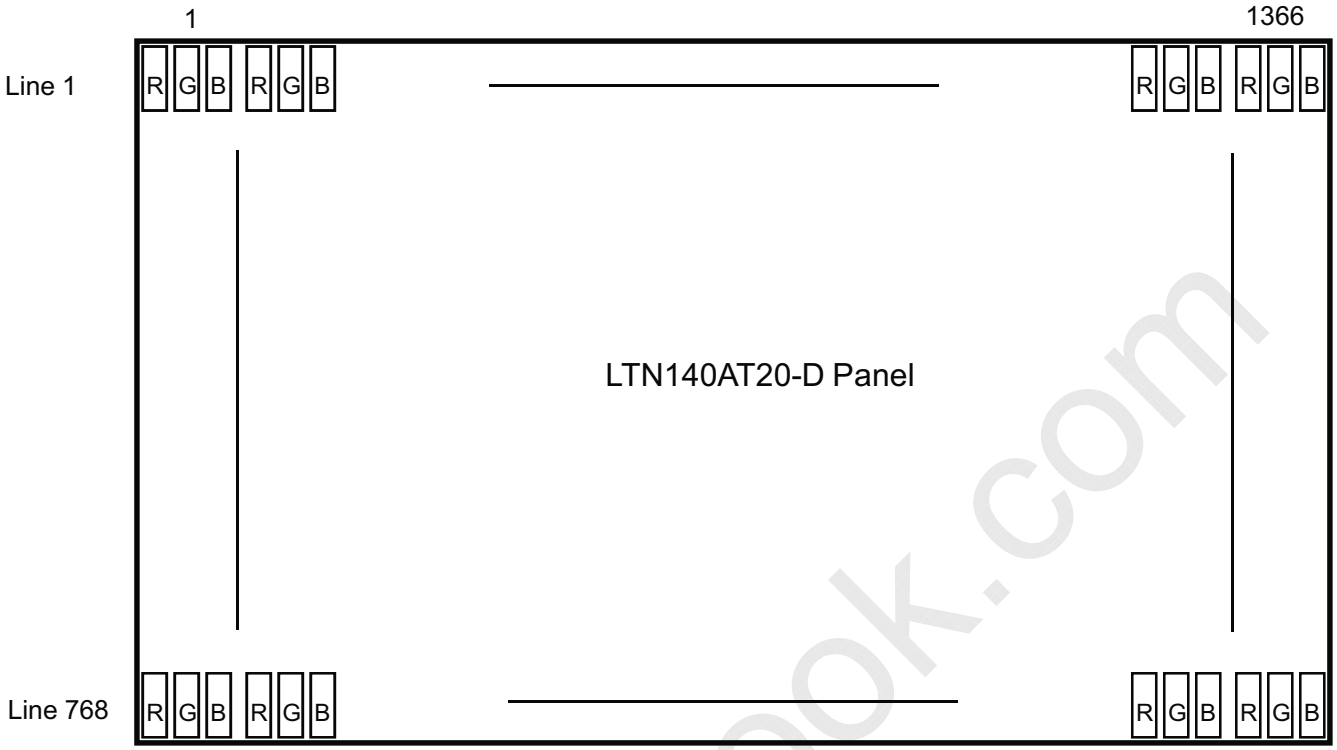
5.6 Pixel Format in the display



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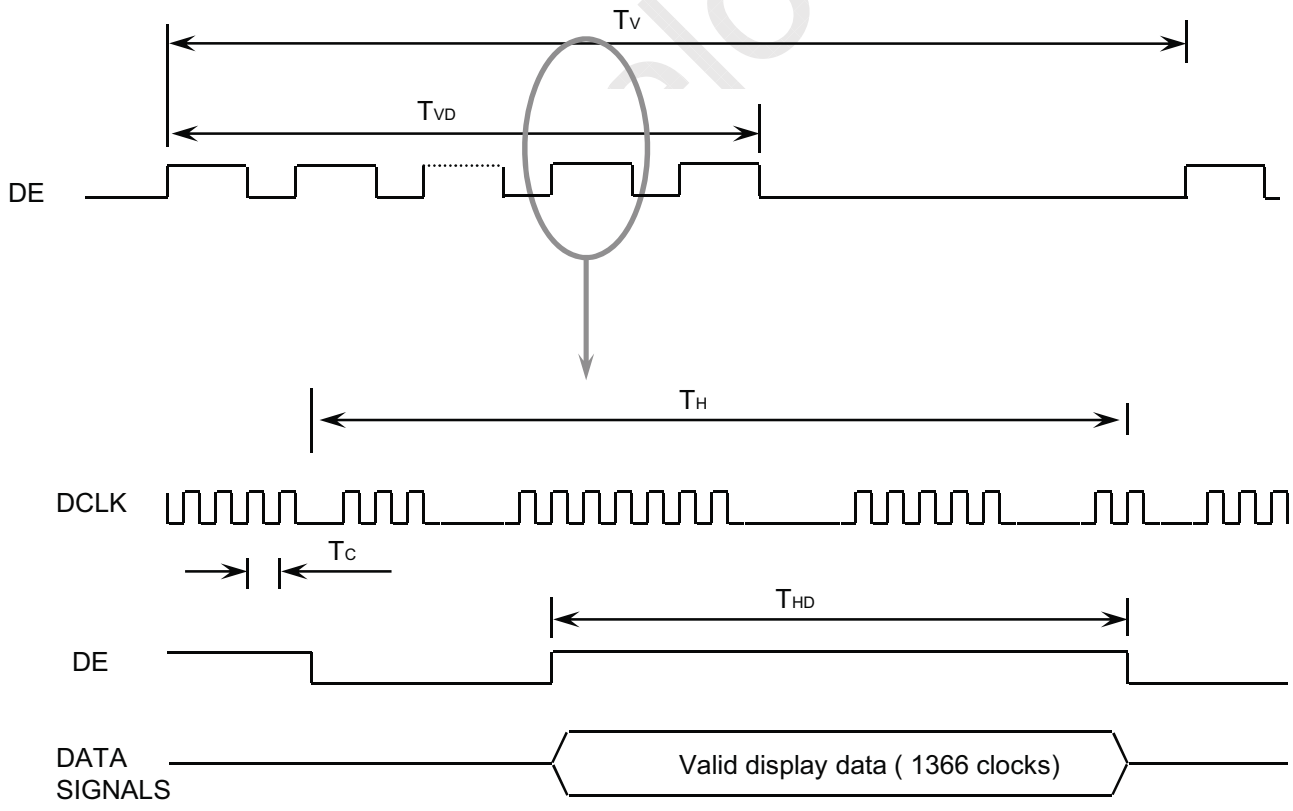
6. INTERFACE TIMING

6.1 Timing Parameters

Signal	Item	Symbol	Min.	Typ.	Max.	Unit	Note
Frame Frequency	Cycle	TV	780	790	880	Lines	-
Vertical Active Display Term	Display Period	TVD	-	768	-	Lines	-
One Line Scanning Time	Cycle	TH	1440	1462	1620	Clocks	-
Horizontal Active Display Term	Display Period	THD	-	1366	-	Clocks	-

6.2 Timing diagrams of interface signal



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6.3 Power ON/OFF Sequence

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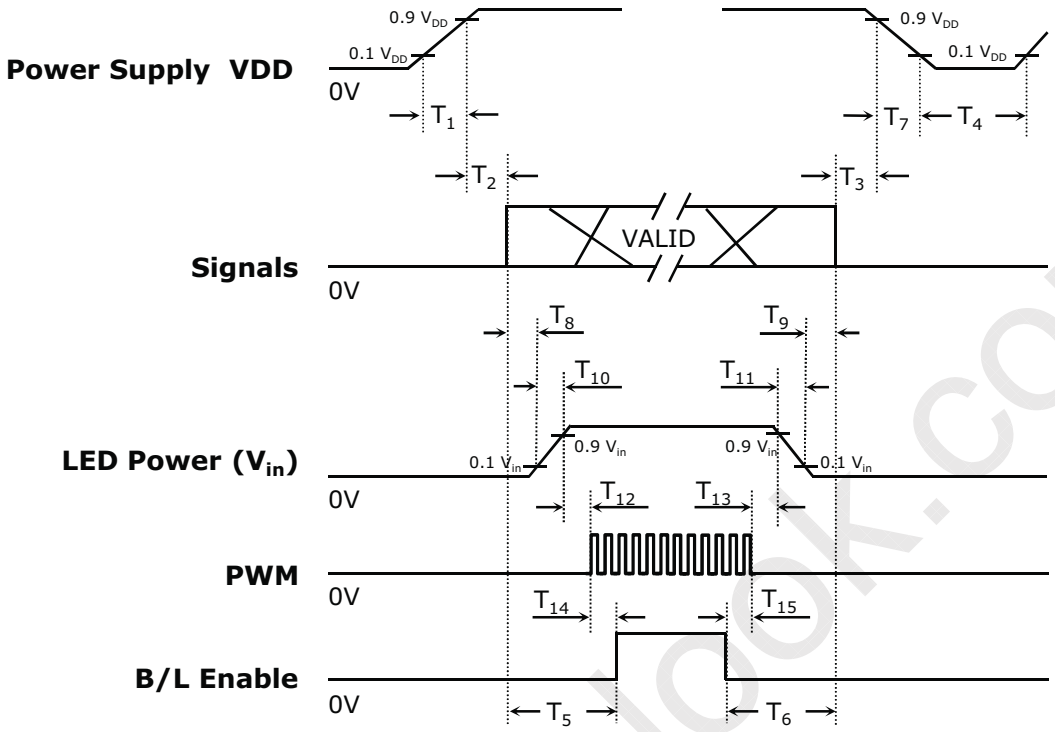
: To prevent a latch-up or DC operation of the LCD module, the power on/off sequence should be as the diagram below.



Timing (ms)	Remarks
$0.5 < T_1 \leq 10$	V_{DD} rising time from 10% to 90%
$0 < T_2 \leq 50$	Delay from V_{DD} to valid data at power ON
$0 < T_3 \leq 50$	Delay from valid data OFF to V_{DD} OFF at power Off
$500 \leq T_4$	V_{DD} OFF time for Windows restart
$200 \leq T_5$	Delay from valid data to B/L enable at power ON
$200 \leq T_6$	Delay from valid data off to B/L disable at power Off
$0 < T_7 \leq 10$	V_{DD} falling time from 90% to 10%
$10 < T_8$	Delay from valid data on to LED driver Vin rising time 10%
$10 < T_9$	Delay from LED driver Vin falling time 10% to valid data Off
$0.5 < T_{10} \leq 10$	LED V_{in} rising time from 10% to 90%
$0.5 < T_{11} \leq 10$	LED V_{in} falling time from 90% to 10%
$10 < T_{12}$	Delay from LED driver Vin rising time 90% to PWM ON
$10 < T_{13}$	Delay from PWM Off to LED driver Vin falling time 10%
$10 < T_{14}$	Delay from PWM ON to B/L Enable ON
$10 < T_{15}$	Delay from B/L Enable Off to PWM Off

Note : Backlight may flash if interface signal remains floating state at invalid period.

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6.3 Power ON/OFF Sequence

NOTE.

(1) The supply voltage of the external system for the module input should be the same as the definition of V_{DD}.

(2) Apply the lamp voltage within the LCD operation range. When the back-light turns on before the LCD operation or the LCD turns off before the back-light turns off, the display may momentarily become white.

(3) In case of V_{DD} = off level, please keep the level of input signals on the low or keep a high impedance.

(4) T4 should be measured after the module has been fully discharged between power off and on period.

(5) Interface signal shall not be kept at high impedance when the power is on.

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7. MECHANICAL OUTLINE DIMENSION

[Refer to the next page]

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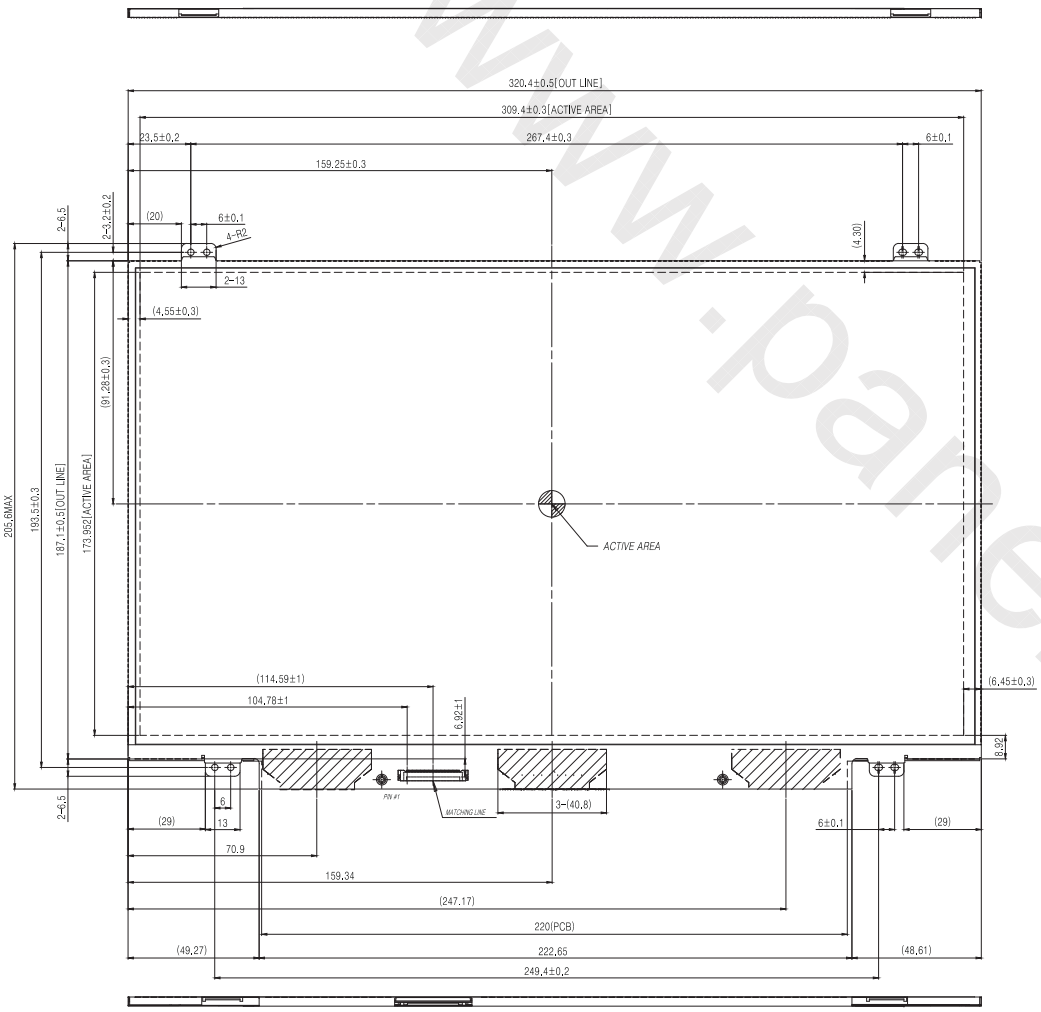

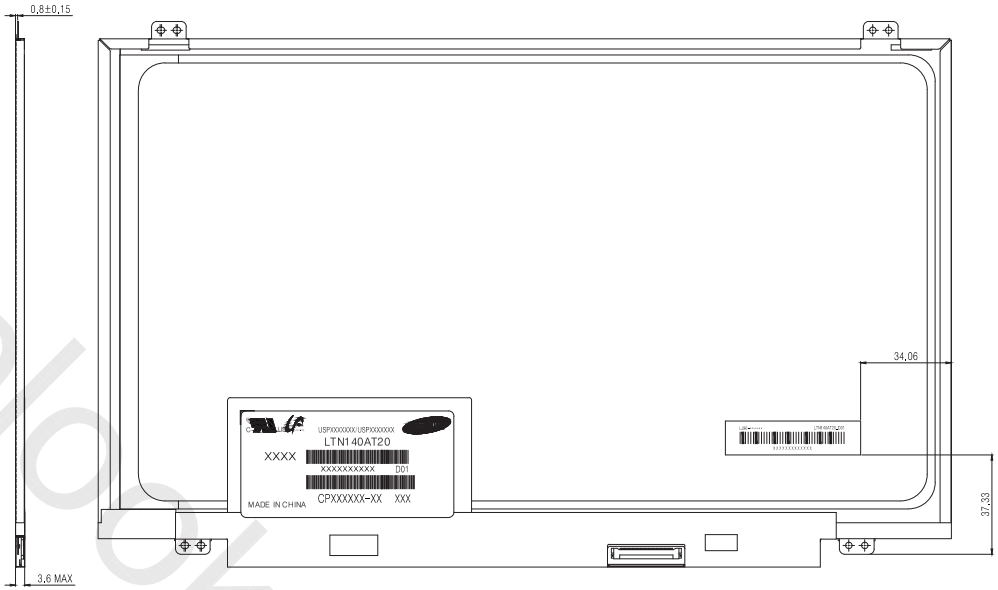

LTN140AT20-D01

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* NOTE

1. INPUT SIGNAL CONNECTOR TO BE SPECIFIED AS BELOW.
   -MAKER / PART NO. : i-PEX / 20455-040E-02S
2. CALIFERS MEASURING FORCE :750 gf-cm
3. WEIGHT : 320g Max.
4. IN ORDER TO AVOID IC DAMAGE, IT IS NOT ALLOW THAT OVERLAPPING OF CABLES OR ANTENNAS, CAMERA, WLAN, WWAN, OVER THESE COF LOCATION.

REV	DATE	DESCRIPTION OF REVISION	REASON	CHK'D BY
UNIT mm	DRAWN BY	DES'D BY	CHK'D BY	APP'D BY
SCALE 1/1		J.G.OH		
GENERAL TOLERANCE ±0.5		11.06.20		
SAMSUNG ELECTRONICS		SPEC. NO		

MODEL NAME	LTN140AT20-D01
PART/SHEET NAME	OUTLINE DIMENSION
CODE NO.	
SHEET	1/1
VER.	0.0

8. PACKING

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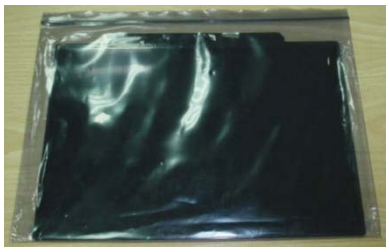
1. CARTON(Internal Package)

(1) Packing Form
Corrugated Cardboard box and EPS form as shock absorber

(2) Packing Method



STEP 1. Putting into the Zipper Bag

STEP 2. Putting on the paper tray

STEP 3. 2 Module / 1 Paper Tray

STEP 4. Folding the Paper Tray

STEP 5. Inserting the Box

STEP 5.Putting the Top Pad

* included AL Bag in the outbox

Note 1)Total Weight : Approximately 15 kg
2) Acceptance number of piling : 30 sets
3) Carton size : 373(W) x 406(D) x 307 (H)

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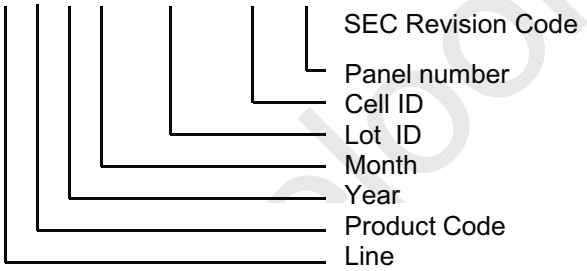
(3) Packing Material

No	Part name	Quantity
1	Static electric protective sack	30 ea
2	Packing case (Inner box)	15 set
3	Pictorial marking	2 pcs
4	Carton	1 set

9. MARKINGS & OTHERS

A nameplate bearing followed by is affixed to a shipped product at the specified location on each product.

(1)Parts number : LTN140AT20-D
(2)Revision code : 3 letters
(3)Lot number : 6 M B F XXX XX X **D01**



(4) Nameplate Indication

Parts name : LTN140AT20-D
Lot number : 6MBFxxxxxx
Inspected work week : 1125
DP/N : Dell Part Number ("04DKPR" is for LTN140AT20-D)

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※ Panel revision code scheme

Build Name(s)	Revision Code(s)
SST (WS)	X00, X01, X02, … X09
PT (ES)	X10, X11, X12, … X19
ST (CS)	X20, X21, X23, … X29
XB (MP)	A00, A01, A02, … A99

(6) Packing box attach

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10. GENERAL PRECAUTIONS

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1. Handling

(a) When the module is assembled, It should be attached to the system firmly using every mounting holes. Be careful not to twist and bend the modules.

(b) Refrain from strong mechanical shock and / or any force to the module. In addition to damage, this may cause improper operation or damage to the module and LED back-light.

(c) Note that polarizers are very fragile and could be easily damaged. Do not press or scratch the surface harder than a HB pencil lead.

(d) Wipe off water droplets or oil immediately. If you leave the droplets for a long time, Staining and discoloration may occur.

(e) If the surface of the polarizer is dirty, clean it using some absorbent cotton or soft cloth.

(f) The desirable cleaners are water, IPA (Isoprophyl Alcohol) or Hexane.
Do not use Ketone type materials(ex. Acetone), Ethyl alcohol, Toluene, Ethyl acid or Methyl chloride. It might permanent damage to the polarizer due to chemical reaction.

(g) If the liquid crystal material leaks from the panel, it should be kept away from the eyes or mouth . In case of contact with hands, legs or clothes, it must be washed away thoroughly with soap.

(h) Protect the module from static , it may cause damage to the C-MOS Gate Array IC.

(i) Use fingerstalls with soft gloves in order to keep display clean during the incoming inspection and assembly process.

(j) Do not disassemble the module.

(k) Do not pull or fold the lamp wire.

(l) Do not adjust the variable resistor which is located on the back side.

(m) Protection film for polarizer on the module shall be slowly peeled off just before use so that the electrostatic charge can be minimized.

(n) Pins of I/F connector shall not be touched directly with bare hands.

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2. STORAGE

(a) Do not leave the module in high temperature, and high humidity for a long time. It is highly recommended to store the module with temperature from 5 to 40°C and relative humidity of less than 70%.

(b) Do not store the TFT-LCD module in direct sunlight.

(c) The module shall be stored in a dark place. It is prohibited to apply sunlight or fluorescent light during the store.

(d) Storage period is recommended not to exceed 1 year

3. OPERATION

(a) Do not connect, disconnect the module in the " Power On" condition.

(b) Power supply should always be turned on/off by following item 6.3 " Power on/off sequence ".

(c) Module has high frequency circuits. Sufficient suppression to the electromagnetic interference shall be done by system manufacturers. Grounding and shielding methods may be important to minimize the interference.

(d) The FPC cable between the LED chips and its converter power supply shall be a minimized length and be connected directly . The longer cable between the back-light and the converter may cause lower luminance of light source (LED).

(e) The standard limited warranty is only applicable when the module is used for general notebook applications. If used for purposes other than as specified, SEC is not to be held reliable for the defective operations. It is strongly recommended to contact SEC to find out fitness for a particular purpose.

4. OTHERS

(a) Ultra-violet ray filter is necessary for outdoor operation.

(b) Avoid condensation of water. It may result in improper operation or disconnection of electrode.

(c) Do not exceed the absolute maximum rating value. (the supply voltage variation, input voltage variation, variation in part contents and environmental temperature, so on) Otherwise the module may be damaged.

(d) If the module displays the same pattern continuously for a long period of time,it can be the situation when the image "sticks" to the screen.

(e) This module has its circuitry PCB's on the rear side and should be handled carefully in order not to be stressed.

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11. EDID

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	Byte (hex)	Field Name and Comments	Value (hex)	Value (binary)
Header	0	Header	00	00000000
	1	Header	FF	11111111
	2	Header	FF	11111111
	3	Header	FF	11111111
	4	Header	FF	11111111
	5	Header	FF	11111111
	6	Header	FF	11111111
	7	Header	00	00000000
Vendor / Product EDID Version	8	EISA manufacture code = 3 Character ID	4C	01001100
	9	EISA manufacture code (Compressed ASCII)	A3	10100011
	0A	Panel Supplier Reserved – Product Code	41	01000001
	0B	Panel Supplier Reserved – Product Code	54	01010100
	0C	LCD module Serial No - Preferred but Optional (“0” if not used)	00	00000000
	0D	LCD module Serial No - Preferred but Optional (“0” if not used)	00	00000000
	0E	LCD module Serial No - Preferred but Optional (“0” if not used)	00	00000000
	0F	LCD module Serial No - Preferred but Optional (“0” if not used)	00	00000000
	10	Week of manufacture	00	00000000
	11	Year of manufacture	15	00010101
	12	EDID structure version # = 1	01	00000001
	13	EDID revision # = 4	04	00000100
Display Parameters	14	Video I/P definition = Digital I/P	90	10010000
	15	Max H image size = (Rounded to cm)	1F	00011111
	16	Max V image size = (Rounded to cm)	11	00010001
	17	Display gamma = (gamma ×100)-100 = Example: (2.2×100) – 100 = 120	78	01111000
	18	Feature support (DPM (Standby, Suspend, Active), Color Type, Other Feature)	0A	00001010
Panel Color Coordinates	19	Red/Green Low bit (RxRy/GxGy)	4B	01001011
	1A	Blue/White Low bit (BxBy/WxWy)	C5	11000101
	1B	Red X Rx = 0.xxx	9C	10011100
	1C	Red Y Ry = 0.xxx	57	01010111
	1D	Green X Gx = 0.xxx	54	01010100
	1E	Green Y Gy = 0.xxx	8C	10001100
	1F	Blue X Bx = 0.xxx	27	00100111
	20	Blue Y By = 0.xxx	17	00010111
	21	White X Wx = 0.xxx	50	01010000
	22	White Y Wy = 0.xxx	54	01010100
Establis hed	23	Established timings 1 (00h if not used)	00	00000000
	24	Established timings 2 (00h if not used)	00	00000000
	25	Manufacturer’s timings (00h if not used)	00	00000000
Standard Timing ID	26	Standard timing ID1 (01h if not used)	01	00000001
	27	Standard timing ID1 (01h if not used)	01	00000001
	28	Standard timing ID2 (01h if not used)	01	00000001
	29	Standard timing ID2 (01h if not used)	01	00000001
	2A	Standard timing ID3 (01h if not used)	01	00000001
	2B	Standard timing ID3 (01h if not used)	01	00000001
	2C	Standard timing ID4 (01h if not used)	01	00000001
	2D	Standard timing ID4 (01h if not used)	01	00000001
	2E	Standard timing ID5 (01h if not used)	01	00000001
	2F	Standard timing ID5 (01h if not used)	01	00000001
	30	Standard timing ID6 (01h if not used)	01	00000001
	31	Standard timing ID6 (01h if not used)	01	00000001
	32	Standard timing ID7 (01h if not used)	01	00000001
	33	Standard timing ID7 (01h if not used)	01	00000001
	34	Standard timing ID8 (01h if not used)	01	00000001
	35	Standard timing ID8 (01h if not used)	01	00000001

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Timing Descripter #1	36	Pixel Clock/10,000 (LSB)	12	00010010
	37	Pixel Clock/10,000 (MSB)	1B	00011011
	38	Horizontal Active = xxxx pixels (lower 8 bits)	56	01010110
	39	Horizontal Blanking (Thbp) = xxxx pixels (lower 8 bits)	60	01100000
	3A	Horizontal Active/Horizontal blanking (Thbp) (upper4:4 bits)	50	01010000
	3B	Vertical Active = xxxx lines	00	00000000
	3C	Vertical Blanking (Tvbp) = xxxx lines (DE Blanking typ. for DE only panels)	16	00010110
	3D	Vertical Active : Vertical Blanking (Tvbp) (upper4:4 bits)	30	00110000
	3E	Horizontal Sync, Offset (Thfp) = xxxx pixels	30	00110000
	3F	Horizontal Sync, Pulse Width = xxxx pixels	20	00100000
	40	Vertical Sync, Offset (Tvfp) = xx lines Sync Width = xx lines	55	01010101
	41	Horizontal Vertical Sync Offset/Width upper 2 bits	00	00000000
	42	Horizontal Image Size =xxx mm	35	00110101
	43	Vertical image Size = xxx mm	AE	10101110
	44	Horizontal Image Size / Vertical image size	10	00010000
	45	Horizontal Border = 0 (Zero for Notebook LCD)	00	00000000
	46	Vertical Border = 0 (Zero for Notebook LCD)	00	00000000
	47	Bit[7] 0: Non-interlace, 1: Interlace Bit[6:5] 00: Normal display, no strero, XX: See table xx for definition Bit[4:3] 00: Analog composite, 01: Bipolar analog composite, 10: Digital composite, 11: Digital separate Bit[2:1] :The interpretation of bits 2 and 1 is dependent on the decode of bits 4 and 3 - see Table 3.18. Bit[0] :See Table VESA EDID spec for definition Referenced Default = 1Ah	1A	00011010
Timing Descripter #2	48	Pixel Clock/10,000 (LSB)	D6	11010110
	49	Pixel Clock/10,000 (MSB)	12	00010010
	4A	Horizontal Active = xxxx pixels (lower 8 bits)	56	01010110
	4B	Horizontal Blanking (Thbp) = xxxx pixels (lower 8 bits)	A0	10100000
	4C	Horizontal Active/Horizontal blanking (Thbp) (upper4:4 bits)	50	01010000
	4D	Vertical Active = xxxx lines	00	00000000
	4E	Vertical Blanking (Tvbp) = xxxx lines (DE Blanking typ. for DE only panels)	16	00010110
	4F	Vertical Active : Vertical Blanking (Tvbp) (upper4:4 bits)	30	00110000
	50	Horizontal Sync, Offset (Thfp) = xxxx pixels	30	00110000
	51	Horizontal Sync, Pulse Width = xxxx pixels	20	00100000
	52	Vertical Sync, Offset (Tvfp) = xx lines Sync Width = xx lines	55	01010101
	53	Horizontal Vertical Sync Offset/Width upper 2 bits	00	00000000
	54	Horizontal Image Size =xxx mm	35	00110101
	55	Vertical image Size = xxx mm	AE	10101110
	56	Horizontal Image Size / Vertical image size	10	00010000
	57	Horizontal Border = 0 (Zero for Notebook LCD)	00	00000000
	58	Vertical Border = 0 (Zero for Notebook LCD)	00	00000000
	59	Bit[7] 0: Non-interlace, 1: Interlace Bit[6:5] 00: Normal display, no strero, XX: See table xx for definition Bit[4:3] 00: Analog composite, 01: Bipolar analog composite, 10: Digital composite, 11: Digital separate Bit[2:1] :The interpretation of bits 2 and 1 is dependent on the decode of bits 4 and 3 - see Table 3.18. Bit[0] :See Table VESA EDID spec for definition Referenced Default = 1Ah	1A	00011010

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Timing Descripter #3 Dell specific information	5A	Flag	00	00000000
	5B	Flag	00	00000000
	5C	Flag	00	00000000
	5D	Data Type Tag: Alphanumeric Data String (ASCII)	FE	11111110
	5E	Flag	00	00000000
	5F	Dell P/N 1st Character	34	00110100
	60	Dell P/N 2nd Character	44	01000100
	61	Dell P/N 3rd Character	4B	01001011
	62	Dell P/N 4th Character	50	01010000
	63	Dell P/N 5th Character	52	01010010
	64	LCD Supplier EEDID Revision # Bit[7] : 0=X, 1=A Bit[6:0] : 00, 01, 02… for SST 10, 11, 12… for PT 20, 21, 22… for ST 00, 01, 02… for X-Build (if Bit[7]=1)	80	10000000
	65	Manufacturer P/N	31	00110001
	66	Manufacturer P/N	34	00110100
	67	Manufacturer P/N	30	00110000
	68	Manufacturer P/N	41	01000001
	69	Manufacturer P/N	54	01010100
	6A	Manufacturer P/N	0A	00001010
	6B	Manufacturer P/N (If <13 char, then terminate with ASCII code 0Ah, set remaining char = 20h)	20	00100000
Timing Descripter #4	6C	Flag	00	00000000
	6D	Flag	00	00000000
	6E	Flag	00	00000000
	6F	Data Type Tag: Manufacturer Specified Data 00	00	00000000
	70	Flag	00	00000000
	71	Color Management (True Color Depth, 2-bit FRC)	00	00000000
	72	Panel Type & Configurations (Bulb/LED string #, Structure Revision, Panel Structure)	41	01000001
	73	Frame Rate Details (SDRRS, DRRS, Max Frame Rate, Min Frame Rate)	21	00100001
	74	Light Controller Interface and Maximum Typical Luminance	94	10010100
	75	Front Surface / Polarizer and Pixel Structure (Transflective, AG/Glossy)	00	00000000
	76	Multi-Media Features (Dynamic Backlight Control, Color Management)	10	00010000
	77	Multi-Media Features (Active Gamma Control, Motion Blur)	00	00000000
	78	Special Features #1 (In-Cell Scanner, Wireless)	00	00000000
	79	Special Features #2 (In-Cell Touch, Interface, Over Drive, LVDS Channel or eDP Lane)	01	00000001
	7A	Special Features #3 (3D, E-Privacy, BIST Support)	01	00000001
	7B	(If <13 char, then terminate with ASCII code 0Ah, set remaining char = 20h)	0A	00001010
	7C	(If <13 char, then terminate with ASCII code 0Ah, set remaining char = 20h)	20	00100000
	7D	(If <13 char, then terminate with ASCII code 0Ah, set remaining char = 20h)	20	00100000
Checksum	7E	Extension flag (# of optional 128 EDID extension blocks to follow, Typ = 0)	00	00000000
	7F	Checksum (The 1-byte sum of all 128 bytes in this EDID block shall = 0)	77	01110111

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